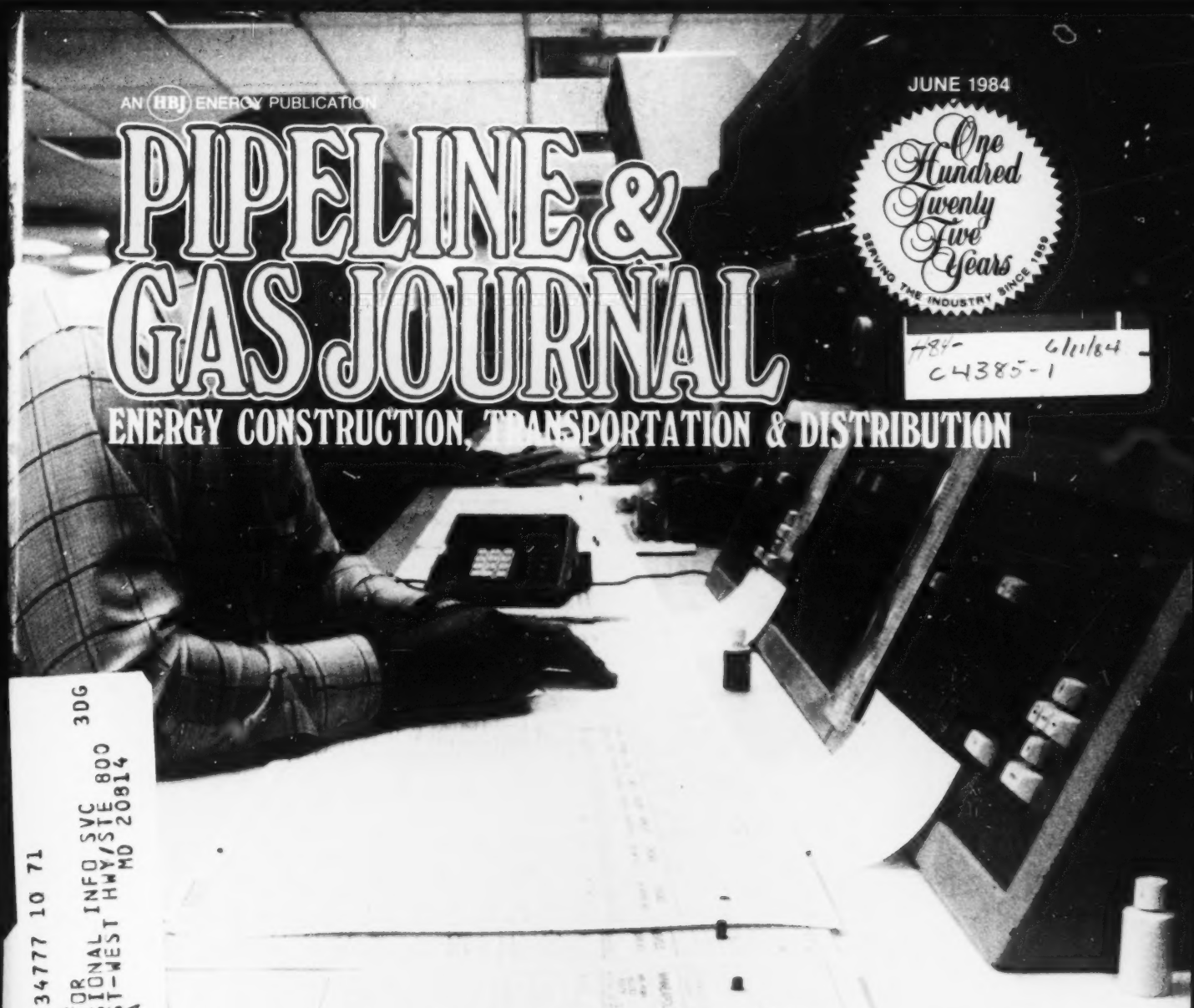

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***Drag Reducers & Flow Improvers***

***Pump Station Modernization***

***Santos Liquids Line's SCADA System***

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**COVER**

Dispatching and system control is an important facet of modern liquids pipeline operations; keeping track of tenders enroute, deliveries, and inputs requires the best of both man and machine.

*— photo courtesy Williams Pipeline Company*


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Exclusive report on the "magic potions" that provide a slick way to increase capacity features high molecular weight polymer being used for many liquids pipeline applications, tells what it is and how it works with details on many applications to date; report also discusses wax crystal modifier additives for waxy crudes and a new emulsion stabilizer used with conventional surfactants for asphaltic crudes.

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# Pump Station Modernization

## Power Costs, Efficiencies, Changing Supply Prompt Renewals

**SPECIAL REPORT**

by Dean Hale, *Editor*

Liquids pipeliners, faced with increasing operating costs and major changes in supply patterns, are modernizing or replacing pump stations at a rapid clip.

During 1984, an estimated 288 mainline crude oil and products pipeline pump stations will be modernized along with 251 crude oil field and gathering stations. Total cost will exceed $131 million.

U.S. crude and products pipeline companies currently operate more than 193,000 miles of mainlines and more than 96,000 miles of crude field and gathering lines.

Higher power costs (most pipeline stations today use electric motors to drive pumps) have accentuated the search for more efficient station operations.

Pipeliners are finding ways to reduce operating costs. Solutions range from machining centrifugal pump impellers to accommodate a wider range of flows to improved electronic controls. Operating at "off peak" power times cuts electrical power costs but complicates scheduling and flow patterns.

Maintenance costs are getting close scrutiny. Stations with a lot of downtime to repair motors, pumps and appurtenances are early candidates for modernizing or replacement.

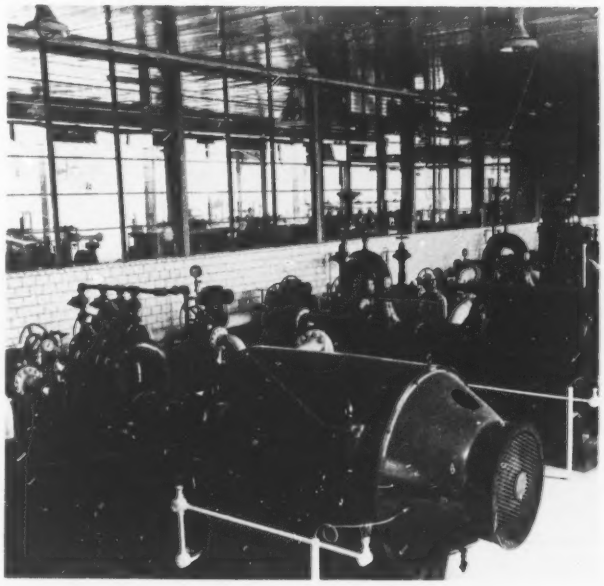
Replacement is the ultimate step. Most of the liquids pipeline companies prefer to modernize and upgrade.

To get a better look at what's happening with the liquids pipelines and their pump station modernizing and replacement programs, PIPELINE & GAS JOURNAL asked key operating management personnel at seven major companies to participate in a special seminar on the subject.

These companies (PGJ 500 Rank of 100 leading liquid pipelines) include ARCO Pipe Line Co. (1), Buckeye Pipe Line Co. (11), Continental Pipe Line Co. (15), Mobil Pipe Line Co. (8), Shell Pipe Line Corp. (4), Sun Pipe Line Co. (17), and Texas Eastern Products Pipe Line Co. (22).

Participants in the seminar included:

**L.F. Clynch,** Manager, Eastern Operations, Continental Pipe Line Co.;
**H.L. Crawford, Jr.,** Vice President, Operations and Engineering, Sun Pipe Line Co.;
**R.C. Darwin,** Manager, Operations Support, Shell Pipe Line Corp.;
**D.L. Dennard,** Vice President, Mobil Pipe Line Co.;
**George J. Fox,** Director, Engineering and Construction, Buckeye Pipe Line Co.;
**Gail M. Stout,** Senior Vice President and Manager of Operations, ARCO Pipe Line Co.;
**John E. Zimmerhanzel,** Manager, Technical Services, Texas Eastern Products Pipe Line Co., and
**Dean Hale,** editor, PIPELINE & GAS JOURNAL.



P&GJ's questions and the participants' responses:

**PGJ:** *What's the major reason for modernizing or replacing a pump station?*

**Dennard:** Two reasons. First, a change in throughput, either up or down, to the extent that the station is no longer functional. Second, an older station that is no longer efficient i.e., pumps need replacing or electrical equipment can be improved. Sometimes a new station needs to be built at a different site to achieve hydraulic balance on the system.
**Zimmerhanzel:** We have to look at everything today — maintenance costs, energy costs, and other economic factors.
**Fox:** Changing capacity requirements and new business. A need to renovate some stations. Power costs.
**Stout:** If you don't modernize, you cannot continue to be competitive in the PGJ 500 list of Top 100 Liquid Pipelines! We are systematically replacing cast iron pump cases with steel pump cases. We are replacing old controls with new solid state electronics. By mid-1985, we will be all-solid state.
**Clynch:** Modernization is an ongoing remedial approach. We modernize when equipment is either worn out or obsolete. Some of our control equipment is 20 years old or older and advances in technology make some equipment obsolete.
**Crawford:** We modernize stations incrementally as a maintenance procedure. We also do it when additional throughput is needed. We will continue to automate stations.

**PGJ:** *How do fuel/energy costs affect the decision?*

**Stout:** Most of our mainline stations are electric and energy costs are a major consideration. Increases in recent years have been very significant. We are always trying to reduce costs.
**Fox:** Power costs are our number one concern. There are many ways to reduce power costs — optimize throughput, use different combinations of stations, use offpeak power whenever possible, rebates, keep demand level down by limiting